USE CASE

GUARDIAN GLASS

THE ORKLA CITY PROJECT

A Dynamic Glazing Solution to Support Light Wellness in an Office Building

Credit: Ivan Brodey

A case study by Guardian Glass based on insights from:

Marco Orlandi
Senior Architect
NSW ARKITEKTUR

Tomas Balčius
Project Manager
STATICUS

Project Details

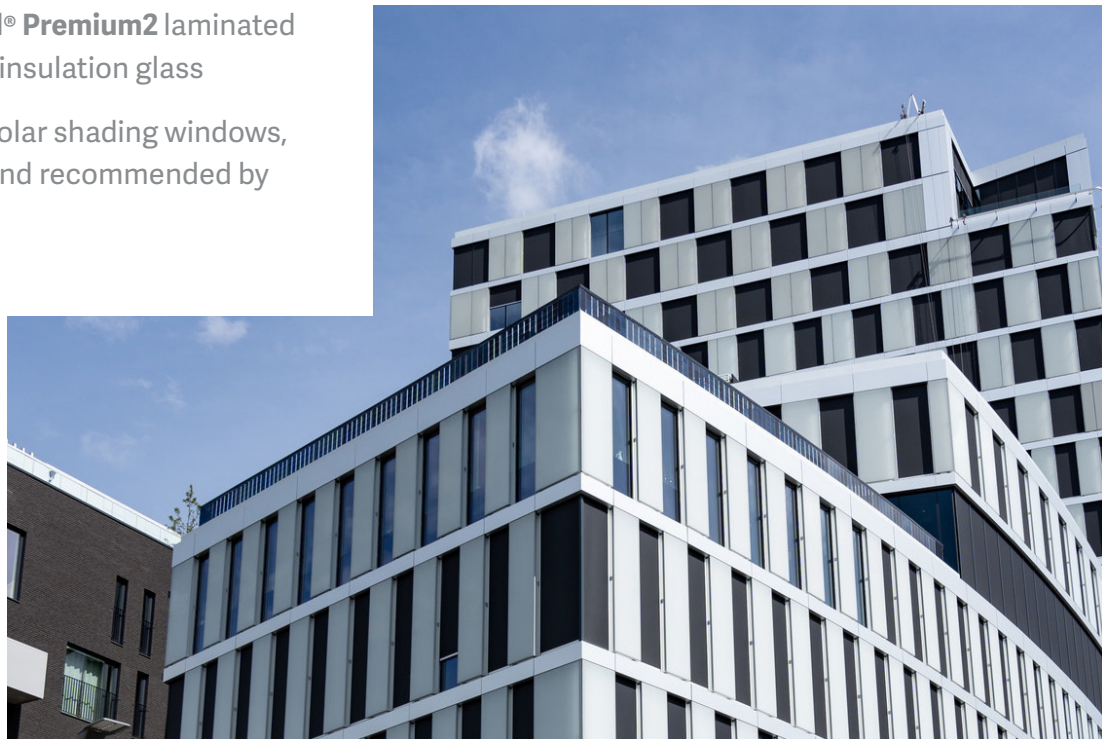
Building owner: ORKLA
Architect: NSW Arkitektur
Facade contractor: Staticus
Glass processor: PRESS GLASS
Main contractor: Skanska

Glass Used

Guardian SunGuard® SuperNeutral (SN) 62/34 high-selective glass

Guardian ClimaGuard® Premium2 laminated acoustic and thermal insulation glass

eyrise® s350 instant solar shading windows, developed by Merck and recommended by Guardian Glass



Focus on The Orkla City Project

Orkla, the leading supplier of branded consumer goods in the Nordic region, has its headquarters in Skøyen, one of Oslo's neighboring hubs in Norway.

Credit: Adam Stirling / Member Media SA

Inaugurated in March 2019, the **Orkla City Project** is an office building that boasts the massive size of 19,500 square meters of usable floor space plus 1,600 square meters of apartments and a parking garage. The main building consists of seven stories with an additional **16-story high tower**.

Considered as an example of modern-day architectural ingenuity, this energy-efficient building incorporates a **holistic design** that brings harmony between its users and the surrounding ecosystem.

The new workspace also embraces activity-based working, providing employees with a versatile environment aimed at improving their **comfort**. It offers an open atmosphere and facilitates a sustainable, modern-living commercial space featuring pop-up stores and restaurants on the ground floor.

The concept for Orkla City Project was to **create a miniature city** inside the building, where its tenants have everything they need under one roof.

Facade details

- Surface of dynamic solar shading windows: 82 m^2
- Number: 23 rectangular panels
- Variety: 7 different sizes
- Color: neutral grey
- Max size: 1,200 x 3,330 mm

- Surface of high-performance glazing: 5,700 m^2
- Number of different flat Insulating Glass Units (IGUs) compositions: 4
- Number of different curved IGUs compositions: 2
- Color: neutral

- Corner solution: glass-to-glass corners

PART 1

Challenges

A Project with High Environmental Ambitions

The Orkla construction project set out with high environmental aspirations.

The whole building had to be equipped with **high-performance glass** in order to facilitate strict control over the amount of sunlight allowed into the building. The facade, on which the building's energy performance depends, had been prefabricated using 50% glass and 50% closed elements.

Furthermore, the client had applied for a grant from the government agency Enova in order to implement **new innovative environmental solutions** for the building. This helped them introduce several innovative energy measures, including a rooftop solar park providing power to the building, which runs completely on smart energy systems.

Additional solar panels were built into balcony railings to hide technical elements on the lower green roof and **eyrise® dynamic liquid crystal glazing** was implemented in the cafeteria area.

This cutting-edge building with an A-grade energy rating qualifies for **BREEAM-NOR Excellent certification**, one of the world's leading sustainability assessment method for buildings.

eyrise® dynamic liquid crystal window solution adapts its shade to the change of sunlight to help prevent overheating as well as bothersome glare inside the cafeteria area.

Combining Performance and Comfort

The key to an efficient energy performance lies in not having to rely on too much heating nor on too much cooling. The main architectural challenge was to strike **the perfect balance** between the facade's insulation and thermal permeability.

Additionally, the team strived to secure the transparency of the facade, which would be more aesthetically pleasing.

"If you want a big glazed surface, you either put blinds outside, or you have to have dark glass – but neither of these options were fully satisfactory. So, we were always looking for a third option..."

Marco Orlandi
Senior Architect at NSW Arkitektur

The Project paid special attention to different types of user convenience: **Comfort was a priority**. This included not only ergonomic considerations but also visual, acoustic, and emotional comfort.

Indeed, in the Orkla City Project, Oslo's surrounding nature remains **very close to its people**. A few floors up, the building offers nice views of fjords on one side and hills on the other.

Although train tracks and a high-traffic road are located near the building, the use of the right acoustic glazing helps provide overall **acoustic comfort** throughout the building.

This way, people are invited to experience the surrounding environment and connect with the outside world holistically, while staying within the **convenience** and **comfort** of modern interior architecture.

Credit: Ivan Brodey

Using Dynamic Glazing for the Cafeteria Area

Creating a Cozy Atmosphere

Glass to glass corner in the cafeteria area, with high performance glazing on the left and dynamic liquid crystal windows on the right.

Creating a relaxing space where one can unwind and recharge takes a lot of **careful planning** and **architectural considerations**. For the cafeteria area in an office building, this is especially true.

High-performance **triple glazing** is used on the overall facade of buildings. The glazing feature a **highly selective solar control glass** that offers a high light transmission for a low g-value, combined with a **low-e laminated acoustic glass** to further improve the Ug value and the acoustic insulation. The facade helps to prevent overheating during sunny days. However, since the triple glazing cannot prevent the glare caused by the sun, the installation of additional blinds was required.

"On a social level, the cafeteria is the heart of an office building. So, comfort in this area was a priority."

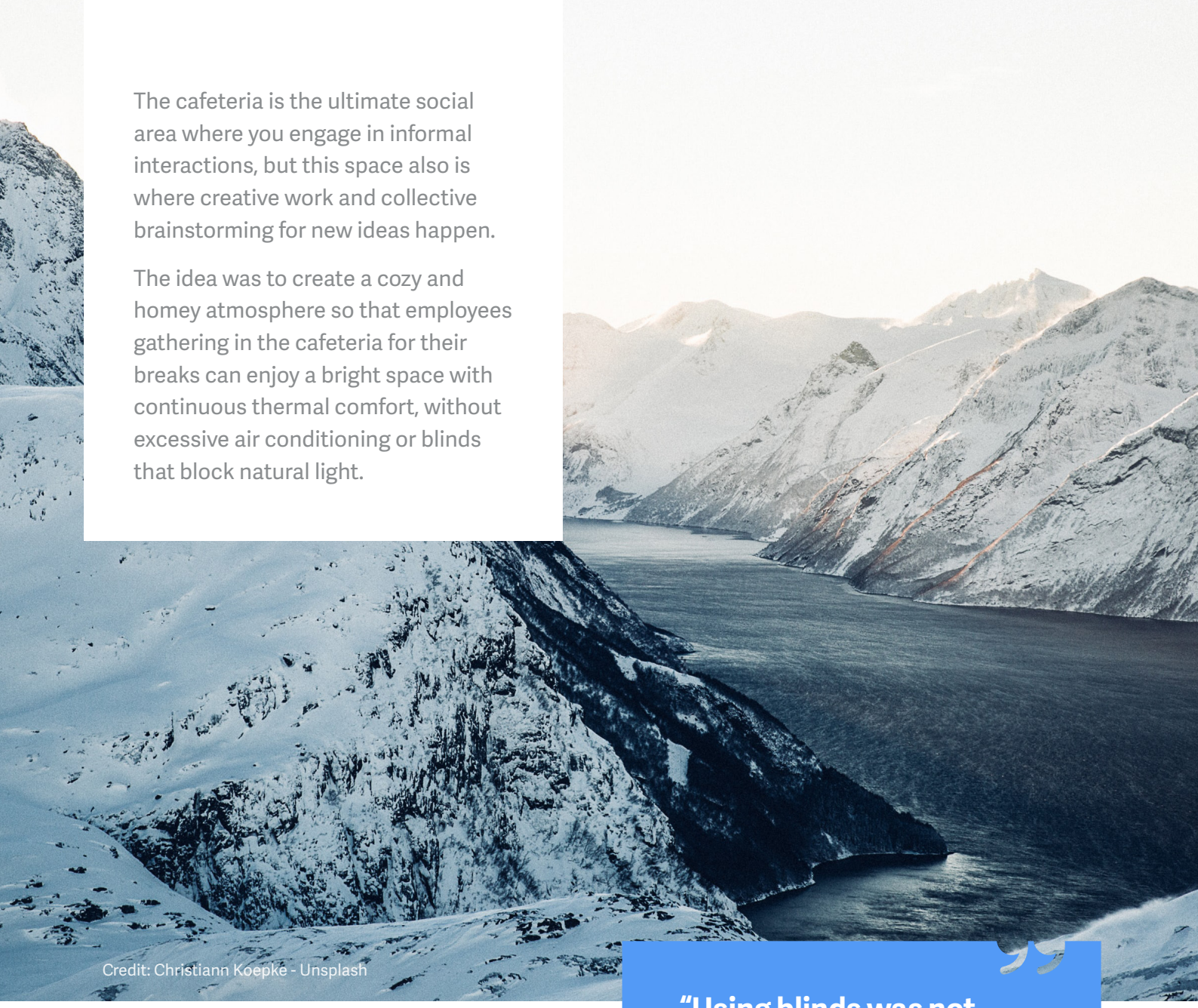
Marco Orlandi
Senior Architect at NSW Arkitektur

But blocking the view and cutting off the natural flow of air ventilation with the blinds was not an option for **Orkla City Project's cafeteria area**, which aims to be a place of connection rather than disconnection both in its architectural design and its functional purpose.

To solve this glare issue and further improve the g-value without the need for installing blinds, the west facade of the cafeteria uses **dynamic glazing**.

The cafeteria is the ultimate social area where you engage in informal interactions, but this space also is where creative work and collective brainstorming for new ideas happen.

The idea was to create a cozy and homey atmosphere so that employees gathering in the cafeteria for their breaks can enjoy a bright space with continuous thermal comfort, without excessive air conditioning or blinds that block natural light.



Credit: Christiann Koepke - Unsplash

“Using blinds was not an option”

Adapting to the Norwegian Climate

Glazed buildings, behind the beautiful exterior, often experience **a common issue**: the challenge to keep the sun outside while allowing natural daylight in. Particularly transparent glass on sunny days can lead to overheating as well as bothersome glare inside the office space. Therefore, blinds are often used to prevent these sources of discomfort.

The problem with blinds, however, is their difficulty to maintain and keep clean. Additionally, they are vulnerable to harsh weather conditions and can become damaged or even malfunction on windy days.

Selecting **the right type of glass** to help improve a building occupant’s comfort is crucial. Cleverly combining high-performance glazing and dynamic glazing was the solution.

PART 2

The Solution

Project Implementation

In order to meet highly technical requirements such as acoustic performance and solar shading, extensive discussions took place between stakeholders before choosing this dynamic glazing solution.

After deciding to go with a solution of liquid crystal glass, the cladder carefully studied several solutions from different suppliers on a sample basis.

Some problems were identified. A few of the suggested products had a bluish tint. Also, the glass was **very slow** to shift its shade throughout the day (from sunrise to sundown).

In regards to comfort, it was essential to have a solution that adapts to the change of sunlight **immediately** and transforms its shade **simultaneously**.

The eyrise® dynamic liquid crystal window solution encompassed all these specifications.

Key steps

- **December 2017:** agree on specifications
- **March 2018:** study samples
- **October 2018:** install the solution

"The eyrise® solution was quite unique as it was real-time transitioning and doing so with a high light transmission"

Tomas Balčius
Project Manager at Staticus

Two Types of Glass that Meet Uniformity Requirements

The project team was asked to carry out a difficult task: to build a facade that would provide the aesthetic uniformity requested by the client, while meeting the standard for energy performance requirements – a challenge that would bring **meaningful innovation** to the field if overcome.

One of the main preoccupations for the architect in this technical aspect was delivering the full, seamless glass corner using the traditional insulating glass units against the liquid crystal glass glazing units. The team knew that the choice of glass was key.

It was essential to find a glazing type with high selectivity and neutrality that could harmonize well with the dynamic glazing solution both technically and aesthetically.

Credit: Daniel McCullough - Unsplash

A Success for the Team, the Client and the Users

The success of the project was a collaborative effort.

The intercorporate team discussed creative ways to actualize the requests made by the client, and the project both met the requirements and **exceeded client expectations**:

- respecting **environmental specifications**
- ensuring **light wellness on demand** through performance, comfort and aesthetics
- delivering **on time**
- following the **budget**
- assuring **proper implementation** of other glass unit

It was a successful project not only in terms of efficiency and in the way that it was managed, but also in office user satisfaction. Ultimately, it is the office users who benefit most from the building's comfort and quality.

The Orkla City Project continues to be acclaimed as a success case for sustainable architectural innovation.

"As the solution was quite transparent, even in its dark state, the users of the cafeteria didn't even notice that it was in place. There is no doubt that I will use this solution again for other projects, if the opportunity arises."

Marco Orlandi
Senior Architect at NSW Arkitektur

Credit: Adam Stirling / Member Media SA

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Do you need advice on selecting the right high-performance or dynamic glazing for your project?

Consult a Guardian Glass expert!

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